HT01-001

1. A read-write head for a magnetic disk, comprising:

a read head between two magnetic shields;

a write head for perpendicular magnetic recording including a write pole and a flux return pole; and

said write pole providing, together with said flux return pole, complete flux closure, whereby magnetic flux returned to the write pole does not flow through either of said magnetic shields.

2. The read-write head described in claim 1 wherein the write pole is between about 3.5 and 6 microns from a read head.

3. The read-write head described in claim 1 wherein the write pole and the flux return pole are separated by a distance that is large enough to allow an optimum vertical field profile.

4. The read-write head described in claim 1 wherein the write pole is between about 3.5 and 7 microns from the flux return pole.

5. The read-write head described in claim 1 wherein the read-write head has a jagging distance that is between about 0.6 and 1 microns.

6. The read-write head described in claim 1 wherein said read head is a SV GMR type read head.

7. The read-write head described in claim 1 wherein said read head is a MTJ GMR type read head.

8. The read-write head described in claim 1 wherein said read head is a CPP GMR type read head.

9. The read-write head described in claim 1 wherein a write coil is located between the write pole and the flux return pole.

10. A read-write head for a magnetic disk, comprising:

a read head, having inner and outer edges, optimized for reading perpendicularly recorded data in a magnetic medium;

the read head disposed to lie between upper and lower shielding layers, each shielding layer having an edge that coplanar with said read head outer edge;

a first spacer layer on said upper shielding layer;

on said spacer layer a first magnetic layer, having an outer edge, that functions as a write pole for perpendicular magnetic recording;

on said first magnetic layer, a second spacer layer;

on said second spacer layer, a thin film coil;

on the second spacer layer and the thin film coil, a third spacer layer;

on the third spacer layer a second magnetic layer having an outer edge;

said outer edges of the read head, the first magnetic layer, and the second magnetic layer all lying in a single plane;

a cavity that extends from the first magnetic layer, through the second and third spacer layers, to the second magnetic layer;

the cavity being disposed so that said thin film coil lies between it and said single plane; and

said cavity being filled with a third magnetic layer that contacts both the first and second magnetic layers.

11. The read-write head described in claim 10 wherein the shielding layers are selected from the group consisting of NiFe and CoZrHf.

12. The read-write head described in claim 10 wherein the first spacer layer has a thickness between about 1.5 and 4 microns.

13. The read-write head described in claim 10 wherein the first magnetic layer has a thickness between about 1 and 3 microns.

14. The read-write head described in claim 10 wherein the second spacer layer has a thickness between about 0.5 and 3 microns.

15. The read-write head described in claim 10 wherein the third spacer layer has a thickness between about 0.5 and 3 microns.

16. The read-write head described in claim 10 wherein the second magnetic layer has a thickness between about 1 and 3 microns.

17. The read-write head described in claim 10 wherein the first magnetic layer is selected from the group consisting of NiFe, CoNiFe, CoFeB, CoNiV, and CoNiMo.

18. The read-write head described in claim 10 wherein the second magnetic layer is selected from the group consisting of NiFe, CoNiFe, CoFeB, CoNiV, and CoNiMo.

19. The read-write head described in claim 10 wherein the third magnetic layer is selected from the group consisting of NiFe, CoNiFe, CoFeB, CoNiV, and CoNiMo.